

**REMARKS**

The Office Action mailed on December 22, 2004, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-7 and 10-18 were pending. By this paper, no claims are cancelled, and claims 19-20 are added. Therefore, claims 1-7 and 10-20 are pending in the present application.

Applicants respectfully submit that the present application is in condition for allowance for the reasons that follow.

**Power of Attorney**

Applicants refer to the signed Power of Attorney form filed with the paper filed on November 07, 2003 to permit the law firm of Foley and Lardner to prosecute the present application.

Applicants request that Examiner Lopez contact Applicants' representatives at (202) 295-4747 if an examiner's amendment is needed to place the case into allowance.

However, Applicants again request that all other future correspondence concerning this application be sent to:

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**Claim Rejections Under 35 U.S.C. §103(a)**

In the Office Action, Claims 1-7 and 10-18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Huggins (U.S. Patent No. 5,741,842) in view of Perlberg (U.S. Patent No. 5,421,503) and the article entitled *Principles of Ceramics*.

Before addressing the merits of the rejections, Applicants first note that the last paragraph of page 2 of the Office Action refers to Sugiyama (U.S. Patent No. 6,080,445) instead of Perlberg, although the remainder of the Office Action refers to Perlberg. Applicants assume that the reference to Sugiyama is a carry-over from the prior Office Action, since other than that singular reference to Sugiyama on page 2, Sugiyama is not referenced again.

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Regarding the substance of the Office Action. In order to advance prosecution and without prejudice or disclaimer, Applicants amend claim 1 to include the recitations regarding borehole diameter detailed in claim 16, and amend claim 19 to be in independent form. That is, claims 2, 10, 12, 13, 14, 15, 16, 17 and 19 are of the same scope of coverage as that of the respective claims just considered by the PTO in formulating the present Office Action.

Applicants respectfully traverse the rejection of the claims, and submit that the entire claim set is now in condition for allowance for at least the following reasons. Applicants rely on MPEP § 2143, which states that:

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

It is respectfully submitted that at least the first and second criteria of MPEP § 2143 have not been met in the Office Action, and that the third criteria has not been met with respect to at least claims 2, 10, 12, 13, 14, 15, 16, 17 and 19, and that the third criteria cannot now be met as to any of the above claims.

The Cited References Do Not Suggest All Claim Recitations

Even if the first requirement of MPEP § 2143 was satisfied in the Office Action (which it is not, as explained below), the cited references still do not meet the third requirement, which is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

Claim 1 recites the action of “extracting substantially all of the organic thermoplastic material from said green tools or blanks and sintering the thus obtained organic-free preforms into dense end products of reduced dimensions respectively including at least one borehole having a diameter of about 10 micrometers or less.” (Claim 1, step “d”, emphasis added.) That is, the method of claim 1 requires the action of obtaining semiconductor wire bonding tools or blanks for such tools by sintering, wherein the sintered tools/blanks include *a borehole of a diameter of about 10 micrometers or less*. It is appreciated by the skilled artisan that such tools are extremely small.

The Office Action asserts that Perlberg teaches bonding tools having boreholes of 13 and 10 micrometers in diameter, and boreholes of less than 10 micrometers. This is not so. In fact, the calculations presented in the Office Action show that Perlberg does not teach such dimensions: the Office Action states that “the bore size of the capillary or bonding wedge is 1.3 mils (*30 microns*).” (Office Action, page 4, emphasis added.) Perlberg teaches, at best, a bonding tool having a through bore of 1.2 mils, which is about 30 micrometers. (See Table 1 of Perlberg.) That is, Perlberg teaches boreholes having diameters of about two-and-a-half times larger than those claimed. Perlberg simply does not teach the recitations regarding boreholes of such small dimensions.

Not only does the combination of Perlberg with Huggins fail to teach each element of claim 1, it also fails to teach each element of claims 11 and 18. That is, the combination fails to teach semiconductor wire bonding wedges. Neither of the cited references disclose or suggest such features. The Office Action asserts that Perlberg teaches “capillary bonding wedges.” (Office Action, page 2, last paragraph.) This is not the case. In fact, Applicants respectfully submit that there is no such thing as a “capillary bonding wedge.”

Perlberg is entirely directed towards making capillary bonding tools. True, Perlberg does mention bonding wedges, but only to differentiate the composition of his capillary bonding tools (ceramics) from those of prior art bonding wedges (tungsten or titanium carbon).

Because the article entitled Principles of Ceramics Processing does not remedy the above identified deficiencies of either Huggins or Perlberg, the claims are allowable.

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In sum, even if the first requirement of MPEP § 2143 is satisfied, the third requirement of MPEP § 2143 is not satisfied in the Office Action, since the cited references do not teach each and every element of the present invention. Thus, the present claims are allowable.

Lack of Suggestion or Motivation to Modify or Combine the References

MPEP § 2143.01, entitled *Suggestion or Motivation to Modify the References*, states that the “prior art *must* suggest the desirability of the claimed invention.” (emphasis added; citations omitted) It further states that obviousness

can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.

(Citations omitted.)

In regard to the combination of Huggins with Perlberg, Huggins is completely silent in even suggesting that the feedstock of Huggins would be appropriate for making semiconductor wire bonding tools. Moreover, even if such a suggestion or teaching existed in Huggins, the skilled artisan would still not know how to utilize the feedstock of Huggins to

control the dimensions of the sintered material to produce a wire bonding tool, particularly in view of the recitations relating to diameter of the boreholes of the sintered end products.

To put it another way, it is unlikely that the ordinary artisan versed in the teachings of Huggins (a ceramic injection molding worker/engineer) would understand the intricacies of semiconductor wire bonding tools, especially with bore holes as recited above. It is also unlikely that the ordinary artisan versed in the teachings of Perlberg (a semiconductor wire bonding worker/engineer) would understand the process of Huggins, especially since other, less complicated processes of making bonding tools, were available. That is, there is no evidence of cross-over knowledge between the arts to non-innovators. It is respectfully submitted that at most only the innovator would have such knowledge. In sum, there is a distinct lack of suggestion in Huggins to combine Huggins with Perlberg.

Moreover, Perlberg teaches away from the invention as claimed. As noted above, Perlberg teaches a bonding tool having a through bore of 1.2 mils, which is about 30 micrometers. Indeed, Perlberg asserts that this significantly differentiates his tools from prior bonding tools, which have bore diameters of 1.5 mils (about 35 micrometers). (See Perlberg, col. 4, lines 36-44, and Table 1.) ***Surely, then, if Perlberg could produce tools with through bores having diameters of less than 35 micrometers, he would have touted such a feat, since all that differentiates his bore diameters from the prior art diameters is a mere 5 micrometers (15% reduction in diameter)! Also, Perlberg teaches that his tools are to be used with a wire having a diameter of 1 mil. Thus, Perlberg necessarily teaches that his tools must have a through bore of at least 25 micrometers in diameter (at least the diameter of a 1 mil wire). Thus, Perlberg teaches away from the present invention.***

Further, sufficient rationale for forming Perlberg bonding tools utilizing the processes of Huggins has not been proffered. The Office Action asserts that “it would have been obvious . . . in order to reduce the sintering time when forming Perlberg ceramics products and to thus increase the rate at which Perlberg ceramics products are produced.” (Office Action, page 3, second full paragraph.) This is not the case. Applicants respectfully submit that the ordinary artisan would have viewed utilizing the teachings of Huggins to form Perlberg tools as decreasing the rate of production, not increasing the rate of production.

It appears that the Office Action relies on common knowledge in the art, as is discussed and permitted in MPEP § 2144.03, to satisfy the first requirement of MPEP § 2143 with respect to “increasing the rate at which Perlberg ceramics are produced.” However, Applicants note that § 2144.03 allows an applicant “to traverse such an assertion,” and that when an applicant does so, “the examiner should cite a reference in support of his or her position.” (MPEP § 2144.03, second paragraph.) Applicants hereby traverse the assertion that it would have been common knowledge in the art that utilizing Huggins would have increased the rate at which Perlberg ceramics are produced. **Applicants thus request, relying on § 2144.03 that the PTO cite a reference and exactly identify where such a reference teaches the alleged optimization, or else allow the claims.**

Also, Perlberg teaches a product of sufficient capabilities vis-à-vis the state of the art as defined therein. Assuming *arguendo* that Perlberg teaches an advancement over his prior art, Applicants submit that the ordinary artisan would have simply stopped at the teachings of Perlberg. Only the innovator would have sought out Huggins to practice Perlberg. Indeed, Applicants submit that the skilled artisan would have considered the teachings of Huggins, to obtain tools according to Perlberg, as an unnecessary complication. There simply was no need to seek out Huggins to practice Perlberg.

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In summary, because of the lack of suggestion or motivation in the prior art to modify the reference, the first requirement of MPEP § 2143 has not been met and, hence, a *prima facie* case of obviousness has not been established.

#### Lack of a Reasonable Expectation of Success

MPEP § 2143.02 permits references to be modified or combined to reject a claim as obvious **only** if there is a reasonable expectation of success. There is no evidence in the references, and certainly none identified in the Office Action, that one of ordinary skill in the art would have a reasonable expectation of success in achieving Applicants’ invention by combining Huggins with Perlberg. For example, the references are silent in regard to



teaching a method of controlling the shrinkage of the sintered material to obtain the tiny components – particularly having boreholes of diameters as claimed. That is, the skilled artisan would not reasonably expect success in making tools as claimed because the artisan would not know how to properly control shrinkage of the feedstock of Huggins.

Thus, one of ordinary skill in the art would not see the combination of the references as successfully producing acceptable tools or blanks for such tools. Because of this, the second criteria of MPEP § 2143 has not been met in the Office Action, a *prima facie* case of obviousness has therefore not been established.

### **New Claims**

As can be seen above, Applicants have added new claims 19-20. Claims 19 and 20 recite the recitations of previously pending claim 1, along with the additional recitation that the “action of extracting substantially all of the organic thermoplastic material from said green tools or blanks and sintering the thus obtained organic-free preforms into dense end products of reduced dimensions results in dense end products comprising tools for semiconductor wire bonding that respectively include at least one borehole having *final dimensions such that bonding wire for bonding semiconductor wires may pass during bonding, wherein the final dimensions of the at least one borehole are obtained during sintering.*” (Emphasis added.) Applicants submit that since the final dimensions of the bonding tools of Perlberg are obtained by machining processes (e.g., EDM, etc.), this recitation is not met by Perlberg, and, therefore, claims 19 and 20 are allowable.

Support for new claims 19 and 20 may be found, among other places, at Fig. 3 and paragraphs 52, 60, and 62. Allowance of these new claims is respectfully requested.

### **Conclusion**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Lopez is invited to contact the undersigned by telephone if it is felt that a telephone interview would expedite allowance of the application.

Respectfully submitted,

Date March 21, 2009

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